

SEQUENCE LISTING

<110> Haarmann & Reimer GmbH

<120> Construction of Production Strains for Producing Substituted Phenols By Specifically Inactivating Genes of the Eugenol and Ferulic Acid Catabolism

<130> Mo-6305/HR-199

<150> PCT/EP99/07952

<151> 2000-05-11

<150> DE 198 50 242.7

<151> 1998-10-31

<160> 18

<170> PatentIn version 3.0

<210> 1

<211> 2164

<212> DNA

<213> Pseudomonas sp

<400> 1

ctgcagccag ggctgaaaag gagggattca gtgaggtcat gaaggaggag gacggcgct	60
ggctccaatt gctcgatggc gccgcgattg agtgtcttgg gcgcggtctt ggagagttcg	120
gctagggaga taaatttgct ggccatggtg gcggcccctg atgggttgga tgattttctg	180
cattctgcat catgaaattc atgaaatcat cacttttcgg ggggtgggtg cacgggattg	240
aaggttgcta ggagagtga ttgctcgtaa gccaggaag cacgcgggtt tcaggatggt	300
gcatggaaat ggcatgagct ttgctggata tgattagaga cattaactat tttggcggaa	360
tggaagcacg attcctcgcc cggtagagcg gtaaccgcga cattcaggac cgtaaaaagg	420
aaagagcatg caactgacca acaagaaaat cgtcgtcacc ggagtgtcct ccggtatcgg	480
tgccgaaact gccgcggtt tgcgctctca cggcgccaca gtgattggcg tagatcgcaa	540
catgccgagc ctgactctgg atgctttcgt tcaggctgac ctgagccatc ctgaaggcat	600
cgataaggcc atcgggacag caagcgaacc ggaattgcc gctggggcgc cctctggtaa	660
ggttgggaag ccctgcaaag taaactggat ggctttcttg ccgccaagga tctgatggcg	720
caggggatca agatctgatc aagagacagg atgaggatcg tttcgcatga ttgaacaaga	780

tggattgcac gcaggttctc cggccgcttg ggtggagagg ctattcggct atgactgggc	840
acaacagaca atcggttgct ctgatgccgc cgtgttcggy ctgtcagcgc aggggcgccc	900
ggttcttttt gtcaagaccg acctgtccg tgcctgaat gaactgcagg acgaggcagc	960
gcggtatcg tggctggcca cgacgggcgt tccttgcgca gctgtgctcg acgttgtcac	1020
tgaagcggga agggactggc tgctattggg cgaagtgccg gggcaggatc tcctgtcatc	1080
tcaccttgct cctgccgaga aagtatccat catggctgat gcaatgcggc ggctgcatac	1140
gcttgatccg gctacctgcc cattcgacca ccaagcgaaa catcgcatcg agcgagcacg	1200
tactcggatg gaagccggtc ttgtcgatca ggatgatctg gacgaagagc atcaggggct	1260
cgcgccagcc gaactgttcg ccaggctcaa ggcgcgcgcatg cccgacggcg aggatctcgt	1320
cgtgacccat ggcgatgcct gcttgccgaa tatcatggtg gaaaatggcc gcttttctgg	1380
attcatcgac tgtggccggc tgggtgtggc ggaccgctat caggacatag cgttggctac	1440
ccgtgatatt gctgaagagc ttggcggcga atgggctgac cgcttcctcg tgctttacgg	1500
tatcgccgct cccgattcgc agcgcatcgc cttctatcgc cttcttgacg agttcttctg	1560
agcgggactc tggggttcga aatgaccgac caagcgacgc cctggccgcy gtgattgcat	1620
tcattgtgtg tgaggagtca cgttggatca acggcataaa tattccagtg gacggaggtt	1680
tggcatcgac ctacgtgtaa gttcgtggac gccctttgca cgcgcactat atctctatgc	1740
agcagctgaa agcagctttg gttttgatcg gaggtagcgg gcggaaaggt gcagaatgtc	1800
taaataataa aggattcttg tgaagcttta gttgtccgta aacgaaaata aaaataaaga	1860
ggaatgatat gaaagcaagt agatcagtct gcactttcaa aatagctacc ctggcaggcg	1920
ccatttatgc agcgctgcca atgtcagctg caaactcgat gcagctggat gtaggtagct	1980
cggattggac ggtgcgttgg ggacaacacc ctcaagtata gccttgccctc tcgcctgaat	2040
gagcaagact caagtctgac aaatgcgccg actgtcaatg gttatatccg gatattcaaa	2100
gtcaggggtga tcgtaacttt gaccgggggc ttggtatcca atcgtctcga tattctggct	2160
gcag	2164

<210> 2
 <211> 2119
 <212> DNA

<213> Pseudomonas sp

<400> 2

ctgcagccag ggctgaaaag gagggattca gtgaggtcat gaaggaggag gacggcgccct	60
ggctccaatt gctcgatggc gccgcgattg agtgtcttgg gcgcgggtctt ggagagtctg	120
gctagggaga taaatttgct ggccatggtg gcggcccctg atgggttgga tgattttctg	180
cattctgcat catgaaattc atgaaatcat cacttttctg ggggtgggtg cacgggattg	240
aagggttgcta ggagagtgca ttgctcgtaa gcccaggaag cacgcgggtt tcaggatggt	300
gcatggaaat ggcatgagct ttgctggata tgattagaga cattaactat tttggcggaa	360
tggaagcacg attcctcgcc cggtagagcg gtaaccgcga cattcaggac cgtaaaaagg	420
aaagagcatg caactgacca acaagaaaat cgtcgtcacc ggagtgtcct ccggtatcgg	480
tgccgaaact gccgcggttc tgcgctctca cggcgccaca gtgattggcg tagatcgcaa	540
catgccgagc ctgactctgg atgctttcgt tcaggctgac ctgagccatc ctgaggggag	600
aggcggtttg cgtattgggc gcatgcataa aaactgttgt aattcattaa gcattctgcc	660
gacatggaag ccatcacaaa cggcatgatg aacctgaatc gccagcggca tcagcacctt	720
gtcgccttgc gtataatatt tgcccatgga cgcacaccgt ggaaacggat gaaggcacga	780
accagttga cataagcctg ttcggttcgt aaactgtaat gcaagtagcg tatgcgctca	840
cgcaactggt ccagaacctt gaccgaacgc agcggtggtg acggcgagc ggcggttttc	900
atggcttggt atgactgttt tttgtacag tctatgcctc gggcatccaa gcagcaagcg	960
cgttacgccg tgggtcgatg tttgatgta tggagcagca acgatgttac gcagcagcaa	1020
cgatgttacg cagcagggca gtcgccctaa aacaaagtta ggtggctcaa gtatgggcat	1080
cattcgcaca tgtaggctcg gccctgacca agtcaaattc atgcgggctg ctcttgatct	1140
tttcggtcgt gagttcggag acgtagccac ctactccaa catcagccgg actccgatta	1200
cctcggaac ttgctccgta gtaagacatt catcgcgctt gctgccttcg accaagaagc	1260
ggttggtggc gctctcgcg cttacgttct gcccaggttt gagcagccgc gtagtgagat	1320
ctatatctat gatctcgag tctccggcga gcaccggagg cagggcattg ccaccgcgt	1380
catcaatctc ctcaagcatg aggccaacgc gcttggtgct tatgtgatct acgtgcaagc	1440
agattacggt gacgatcccg cagtggctct ctatacaaag ttgggcatac gggaagaagt	1500

gatgcacttt gatatcgacc caagtaccgc cacctaacaa ttcgttcaag ccgagatcgg 1560
 cttccctgat tgcattcatg tgtgctgagg agtcacgttg gatcaacggc ataaatattc 1620
 cagtggacgg aggtttggca tcgacctacg tgtaagttcg tggacgccct ttgcacgcgc 1680
 actatatctc tatgcagcag ctgaaagcag ctttggtttt gatcggaggt agcgggcgga 1740
 aaggtgcaga atgtctaaat aataaaggat tcttgtgaag ctttagttgt ccgtaaacga 1800
 aaataaaaat aaagaggaat gatatgaaag caagtagatc agtctgcact ttcaaaatag 1860
 ctaccctggc aggcgccatt tatgcagcgc tgccaatgtc agctgcaaac tcgatgcagc 1920
 tggatgtagg tagctcggat tggacggtgc gttggggaca acaccctcaa gtatagcctt 1980
 gcctctcgcc tgaatgagca agactcaagt ctgacaaatg cgccgactgt caatggttat 2040
 atccggatat tcaaagtcag ggtgatcgta actttgaccg ggggcttggt atccaatcgt 2100
 ctcgatattc tggctgcag 2119

<210> 3
 <211> 1120
 <212> DNA
 <213> Pseudomonas sp

<400> 3
 ctgcagccag ggctgaaaag gagggattca gtgaggatcat gaaggaggagg gacggcgcct 60
 ggctccaatt gctcgatggc gccgcgattg agtgtcttgg gcgcggtctt ggagagttcg 120
 gctagggaga taaatttgct ggccatggtg gcggcccctg atgggttggg tgattttctg 180
 cattctgcat catgaaattc atgaaatcat cacttttcgg ggggtgggtg cacgggattg 240
 aaggttgcta ggagagtgca ttgctcgtaa gccaggaag cacgcgggtt tcaggatggt 300
 gcatggaaat ggcatgagct ttgctggata tgattagaga cattaactat tttggcggaa 360
 tggaaacacg attcctcgcc cggtagagcg gtaaccgcga cattcaggac cgtaaaaagg 420
 aaagagcatg caactgacca acaagaaaat cgtcgtcacc ggagtgtcct ccggtatcgg 480
 tgccgaaact gcccgcggtc tgcgctctca cggcgccaca gtgattggcg tagatcgcaa 540
 catgccgagc ctgactctgg atgctttcgt tcaggctgac ctgagccatc ctgaaggcat 600
 cgatcaacgg cataaatatt ccagtggacg gaggtttggc atcgacctac gtgtaagttc 660

gtggacgccc tttgcacgcg cactatatct ctatgcagca gctgaaagca gcttttggtt	720
tgatcggagg tagcgggcg aaaggtgcag aatgtctaaa taataaagga ttcttgtgaa	780
gctttagttg tccgtaaacg aaaataaaaa taaagaggaa tgatatgaaa gcaagtagat	840
cagtctgcac tttcaaaata gctaccctgg caggcgccat ttatgcagcg ctgccaatgt	900
cagctgcaaa ctcgatgcag ctggatgtag gtagctcgga ttggacgggtg cgttggggac	960
aacaccctca agtatagcct tgcctctcgc ctgaatgagc aagactcaag tctgacaaat	1020
gcgccgactg tcaatggta tatccggata ttcaaagtca gggatgatcgt aactttgacc	1080
gggggcttgg tatccaatcg tctcgatatt ctggctgcag	1120

<210> 4
 <211> 2822
 <212> DNA
 <213> Pseudomonas sp

<400> 4	
gaattccgcg tatcgcccg ttctatcagc gggccgcttt cgaaagtcag ggtgttagcc	60
ggtagggtct ttttcttggc catgcttggt gcctgaacct tcgttgacat agggcagagg	120
tgcgtttgcc gcttcgcttc gcgatgaacc gcatcgagat gctgagggtca ggatttttcc	180
ttaactcgcg taagcattct gtcatttttt tgggtggcttt gaacagcctg atgaaagggtg	240
gtctcgccct ttgaggccga ttcttgggcg cttggcggcg tcgaagcgat gctccactac	300
cgattaagat aattaaaata aggaaaccgc atggtttctt atgtgaattt gtctggcata	360
ctccagctca agggcaattt ttgggctatt ggctgagcag ttgcctctat atggttattc	420
agaataacaa ttgactcctc aggaggtcag cgatgagcat tcttggtttg aatggtgccc	480
cggtcggagc tgagcagctg ggctcggctc ttgatcgcat gaagaaggcg cacctggagc	540
aggggctgc aaacttggag ctgcgtctga gtaggctgga tcgtgcgatt gcaatgcttc	600
tggaaaatcg tgaagcaatt gccgacgcg tttctgctga ctttggcaat cgcagccgtg	660
agcaaacact gctttgcgac attgctggct cggtggcaag cctgaaggat agccgcgagc	720
acgtggccaa atggatggag cccgaacatc acaaggcgat gtttccaggg gcggaggcac	780
gcgttgagtt tcagccgctg ggtgtcgttg gggtcattag tccctggaac ttcctatcgc	840
tactggcctt tgggcccgtg gccggcatat tcgcagcagg taatcgcgcc atgctcaagc	900

cgccccgagct taccgccgcg acttctgccc tgcttgccga gctaattgct cggtacttcg	960
atgaaactga gctgactaca gtgctgggcg acgctgaagt cggcgcgctg ttcagtgttc	1020
agcctttcga tcatctgac ttcaccggcg gcactgccgt ggccaagcac atcatgcgtg	1080
ccgcggcgga taacctagt cccgttaccc tggaattggg tggcaaactc cgggtgatcg	1140
tttcccgag tgcagatatg ggggacgttg cacaacgggt gttgacggtg aaaaccttca	1200
atgccgggca aatctgtctg gcaccggact atgtgctgct gccggaaggg acagcaagcg	1260
aaccggaatt gccagctggg gcgccctctg gtaagggttg gaagccctgc aaagtaaact	1320
ggatggcttt cttgccgcca aggatctgat ggcgcagggg atcaagatct gatcaagaga	1380
caggatgagg atcgtttcgc atgattgaac aagatggatt gcacgcagg tctccggccg	1440
cttgggtgga gaggctattc ggctatgact gggcacaaca gacaatcggc tgctctgatg	1500
ccgccgtgtt ccggtgtca gcgcaggggc gcccggttct ttttgtcaag accgacctgt	1560
ccggtgccct gaatgaactg caggacgagg cagcgcggct atcgtggctg gccacgacgg	1620
gcgttccttg cgcagctgtg ctgcacgttg tcaactgaagc gggaaggggac tggctgctat	1680
tgggcgaagt gccggggcag gatctcctgt catctcacct tgctcctgcc gagaaagtat	1740
ccatcatggc tgatgcaatg cggcggtgc atacgctga tccggctacc tgcccattcg	1800
accaccaagc gaaacatcg atcgagcgag cacgtactcg gatggaagcc ggtcttgtcg	1860
atcaggatga tctggacgaa gagcatcagg ggctcgcgcc agccgaactg ttcgccaggc	1920
tcaaggcgcg catgcccgc ggcgaggatc tcgtcgtgac ccatggcgat gcctgcttgc	1980
cgaatatcat ggtggaaaat ggccgctttt ctggattcat cgactgtggc cggctgggtg	2040
tggcggaccg ctatcaggac atagcgttg ctaccctga tattgtgaa gagcttggcg	2100
gcgaatgggc tgaccgcttc ctgctgcttt acggtatcgc cgctcccgat tcgcagcgca	2160
tcgccttcta tcgccttctt gacgagttct tctgagcggg actctggggg tcgaaatgac	2220
cgaccaagcg acgcccgcga tgccaagcct gttctcgtgc aaagtcctgt ggggtgagtcg	2280
aacttggcga tgcgcgcacc ctacggagaa gcgatccacg gactgctctc tgtcctcctt	2340
tcaacggagt gttagaaccg ttggtagtgg ttttgacgg gcccaggagc atgcgcttct	2400
gggcccgttt cttgagtatt cattggatag tcacgcgtgg tagcttcgag cctgcacagc	2460

tgatgagcac cctggaaggc gcgctgtacg cggacgactg ggttcattctt cgccattcat	2520
gacggaactc cgttccccag taccgcatg actatatttgc ctcttccgat gtccgattcc	2580
acgccgcctg acgctaagcg ggggcggggg cgcccgcatc ccagcccaga cagcaacaaa	2640
tgagtaggct cttggatgcc gcggcggctg agattggtaa cggcaatttc gtcaatgtga	2700
cgatggattc gattgcccgt gctgccggcg tctcaaaaaa aacgctgtac gtcttggtgg	2760
cgagcaagga agaactcatt tcccggtag tggctcgaga catgtccaac cttgaggaat	2820
tc	2822

<210> 5
 <211> 2775
 <212> DNA
 <213> Pseudomonas sp

<400> 5	
gaattccgcg tatcgcccg ttctatcagc gggccgcttt cgaaagtcatt ggtggttagcc	60
ggtagggtct ttttcttggc catgcttgtt gcctgaacct tcggtgacat agggcagagg	120
tgcgtttgcc gcttcgcttc gcgatgaacc gcatcgagat gctgaggtca ggatttttcc	180
ttaactcgcg taagcattct gtcatttttt tgggtggcttt gaacagcctg atgaaagggtg	240
gtctcgccct ttgaggccga ttcttgggcg cttggcgggc tcgaagcgat gctccactac	300
cgattaagat aattaaaata aggaaaccgc atggtttctt atgtgaattt gtctggcata	360
ctccagctca agggcaattt ttgggctatt ggctgagcag ttgcctctat atggttattc	420
agaataacaa ttgactcctc aggaggtcag cgatgagcat tcttggtttg aatggtgccc	480
cggtcggagc tgagcagctg ggctcggctc ttgatcgcat gaagaaggcg cacctggagc	540
aggggcctgc aaacttggag ctgcgtctga gtaggctgga tcgtgcgatt gcaatgcttc	600
tggaaaatcg tgaagcaatt gccgacgcg tttctgctga ctttggcaat cgcagccgtg	660
agcaaacact gctttgcgac attgctggct cgggtggcaag cctgaaggat agccgcgagc	720
acgtggccaa atggatggag cccgaacatc acaaggcgat gtttccaggg gcggaggcac	780
gcgttgagtt tcagccgctg ggtgtcggtt gggtcattag tccctggaac ttccctatcg	840
tactggcctt tgggcccgtg gccggcatat tcgcagcagg taatcgcgcc atgctcaagc	900

cgtccgagct taccocgcgg acttctgccc tgcttgcgga gctaattgct cgttacttcg	960
atgaaactga gctgactaca gtgctgggcg acgctgaagt cgggtgcgctg ttcagtgtctc	1020
agcctttcga tcatctgac ttcaccggcg gcaactgccgt ggccaagcac atcatgcgtg	1080
ccgcggcgga taacctagt cccggttacc tggaattggg tggcaaactcg ccggtgatcg	1140
tttcccgcag tgcagatatg gcggacgttg cacaacgggt gttgacgggtg aaaaccttca	1200
atgccgggca aatctgtctg gcaccggact atgtgctggg ggagaggcgg tttgcgtatt	1260
gggcgcatgc ataaaaactg ttgtaattca ttaagcattc tgccgacatg gaagccatca	1320
caaacggcat gatgaacctg aatcgccagc ggcatcagca ccttgctgcc ttgcgtataa	1380
tatttgccca tggacgcaca ccgtggaac ggatgaaggc acgaaccag ttgacataag	1440
cctgttcggt tcgtaactg taatgcaagt agcgtatgcg ctacgcgaac tgggtccagaa	1500
ccttgaccga acgcagcggg ggtaacggcg cagtggcggg tttcatgggt tgttatgact	1560
gtttttttgt acagtctatg cctcgggcat ccaagcagca agcgcgttac gccgtgggtc	1620
gatgtttgat gttatggagc agcaacgatg ttacgcagca gcaacgatgt tacgcagcag	1680
ggcagtcgcc ctaaaacaaa gttaggtggc tcaagtatgg gcatcattcg cacatgtagg	1740
ctcggccctg accaagtcaa atccatgcgg gctgctcttg atcttttcgg tcgtgagttc	1800
ggagacgtag ccacctactc ccaacatcag ccggactccg attacctcg gaacttgctc	1860
cgtagtaaga cattcatcgc gcttgctgcc ttcgaccaag aagcggttgt tggcgctctc	1920
gcggcttacg ttctgcccag gtttgagcag ccgcgtagt agatctatat ctatgatctc	1980
gcagtctccg gcgagcaccg gaggcagggc attgccaccg cgctcatcaa tctcctcaag	2040
catgaggcca acgcgcttg tgcttatgtg atctacgtgc aagcagatta ccgtgacgat	2100
cccgcagtgg ctctctatac aaagttgggc atacgggaag aagtgatgca ctttgatata	2160
gacccaagta ccgccaccta acaattcggt caagccgaga tcggcttccc tgcaaagtcc	2220
tgtgggtgag tcgaacttg cgatgcgcgc accctacgga gaagcgatcc acggactgct	2280
ctctgtcctc ctttcaacgg agtggttagaa ccgttggtag tggttttgga cgggcccagg	2340
agcatgcgct tctgggcccg tttcttgagt attcattgga tagtcacgcg tggtagcttc	2400
gagcctgcac agctgatgag caccctggaa ggcgcgctgt acgcggacga ctgggttcat	2460


```

cttcgccatt catgacggaa ctccgttccc cagtaccgcg atgactatTT tgcctcttcc 2520
gatgtccgat tccacgccgc ctgacgctaa gcgggggcgg gggcgcccgc atcccagccc 2580
agacagcaac aaatgagtag gctcttgat gccgcggcgg ctgagattgg taacggcaat 2640
ttcgtcaatg tgacgatgga ttcgattgcc cgtgctgccg gcgtctcaaa aaaaacgctg 2700
tacgtcttgg tggcgagcaa ggaagaactc atttcccggT tagtggctcg agacatgtcc 2760
aaccttgagg aattc 2775

```

```

<210> 6
<211> 1779
<212> DNA
<213> Pseudomonas sp

```

```

<400> 6
gaattccgcg tatcggccgg ttctatcagc gggccgcttt cgaaagtcatt ggtgttagcc 60
ggtaggggtct ttttcttggc catgcttggt gcctgaacct tcgttgacat agggcagagg 120
tgcgtttgcc gcttcgcttc gcgatgaacc gcacgagat gctgaggtca ggatttttcc 180
ttaactcgcg taagcattct gtcatttttt tgggtggcttt gaacagcctg atgaaaggtg 240
gtctcgccct ttgaggccga ttcttgggcg cttggcggcg tcgaagcgat gctccactac 300
cgattaagat aattaaaata aggaaaccgc atggtttctt atgtgaattt gtctggcata 360
ctccagctca agggcaattt ttgggctatt ggctgagcag ttgcctctat atggttattc 420
agaataacaa ttgactcctc aggaggtcag cgatgagcat tcttggtttg aatggtgccc 480
cggtcggagc tgagcagctg ggctcggctc ttgatcgcat gaagaaggcg cacctggagc 540
aggggcctgc aaacttggag ctgctgtctga gtaggctgga tcgtgcgatt gcaatgcttc 600
tggaaaatcg tgaagcaatt gccgacgcgg tttctgctga ctttggcaat cgagccgctg 660
agcaaacact gctttgcgac attgctggct cgggtggcaag cctgaaggat agccgcgagc 720
acgtggccaa atggatggag cccgaacatc acaaggcgat gtttccaggg gcggaggcac 780
gcgttgagtt tcagccgctg ggtgtcgttg gggtcattag tcctggaac ttccctatcg 840
tactggcctt tgggcccgtg gccggcatat tcgcagcagg taatcgcgcc atgctcaagc 900
cgtccgagct taccgcgcg acttctgccc tgcttgcgga gctaattgct cgttacttcg 960
atgaaactga gctgactaca gtgctgggcg acgctgaagt cgggtgcgctg ttcagtgtc 1020

```

```

agcctttcga tcattctgatc ttcaccggcg gcactgccgt ggccaagcac atcatgcgtg 1080
ccgcggcgga taacctagtg cccgttaccc tggaattggg tggcaaatac ccggtgatcg 1140
tttcccgag tgcagatatg gcggacgttg cacaacgggt gttgacggtg aaaaccttca 1200
atgccgggca aatctgtctg gcaccgtggg tgagtcgaac ttggcgatgc gcgcacccta 1260
cggagaagcg atccacggac tgctctctgt ctccttttca acggagtgtt agaaccgttg 1320
gtagtggttt tggacgggcc caggagcatg cgcttctggg cccgtttctt gagtattcat 1380
tggatagtca cgcgtggtag cttcgagcct gcacagctga tgagcaccct ggaaggcgcg 1440
ctgtacgcgg acgactgggt tcattcttgc cattcatgac ggaactccgt tccccagtac 1500
cgcgatgact attttgctc ttccgatgtc cgattccacg ccgcctgacg ctaagcgggg 1560
gcggggggcg ccgcatccca gccagacag caacaaatga gtaggctctt ggatgccgcg 1620
gcggctgaga ttggtaacgg caatttcgtc aatgtgacga tggattcgat tgcccgtgct 1680
gccggcgtct caaaaaaaaaac gctgtacgtc ttggtggcga gcaaggaaga actcatttcc 1740
cggttagtgg ctcgagacat gtccaacctt gaggaattc 1779

```

```

<210> 7
<211> 2188
<212> DNA
<213> Pseudomonas sp

```

```

<400> 7
ctgcagccga gcacgattg agcactttac ccagctgcgc tggctgacca ttcagaatgg 60
cccgcgccac tatccaatct aaatcgatct tcgggcgccg cgggcatcat gcccgcggcg 120
ctcgctcat ttcaatctct aacttgataa aaacagagct gttctccggt cttggtggat 180
caaggccagt cgcggagagt ctggaagagg agagtacagt gaacgccgag tccacattgc 240
aaccgcaggc atcatcatgc tctgctcagc cagctaccg cagtgtgtcg attggtcatc 300
ctccggttga ggttacgcaa gacgctggag gtattgtccg gatgcgttct ctcgaggcgc 360
ttcttccctt cccgggtcga attcttgagc gtctcgagca ttgggctaag acccgtccag 420
aaciaaacctg cgttgctgcc agggcggcaa atggggaatg gcgtcgtatc agctacgcgg 480
aatgtttcca caacgtccgc gccatcgcac agagcttgct tccttacgga ctatcggcag 540

```

agcgtccgct gcttatcgtc tctggaaatg acctggaaca tcttcagctg gcatttgggg	600
ctatgtatgc gggcattccc tattgcccgg tgtctcctgc ttattcactg ctgtcgcaag	660
atttggcgaa gctgcgtcac atcgtaggtc ttctgcaacc gggactggtc tttgctgccg	720
atgcagcacc tttccagggg acagcaagcg aaccggaatt gccagctggg gcgccctctg	780
gtaaggttgg gaagccctgc aaagtaaact ggatggcttt cttgccgcca aggatctgat	840
ggcgcagggg atcaagatct gatcaagaga caggatgagg atcgtttcgc atgattgaac	900
aagatggatt gcacgcaggt tctccggccg cttgggtgga gaggctattc ggctatgact	960
gggcacaaca gacaatcggc tgctctgatg ccgccgtgtt ccggctgtca gcgcaggggc	1020
gcccggttct ttttgtcaag accgacctgt ccggtgccct gaatgaactg caggacgagg	1080
cagcgcggct atcgtaggtg gccacgacgg gcgttccttg cgcagctgtg ctcgacgttg	1140
tcactgaagc gggaaggac tggctgctat tgggcgaagt gccggggcag gatctcctgt	1200
catctcacct tgctcctgcc gagaaagtat ccatcatggc tgatgcaatg cggcggctgc	1260
atacgttga tccggctacc tgccattcg accaccaagc gaaacatcgc atcgagcgag	1320
cacgtactcg gatggaagcc ggtcttgctg atcaggatga tctggacgaa gagcatcagg	1380
ggctcgcgcc agccgaactg ttcgccaggc tcaaggcgcg catgcccgcg ggcgaggatc	1440
tcgtcgtgac ccatggcgat gcctgcttgc cgaatatcat ggtggaaaat ggccgctttt	1500
ctggattcat cgactgtggc cggctgggtg tggcggaccg ctatcaggac atagcgttgg	1560
ctacccgtga tattgctgaa gagcttgggc gcgaatgggc tgaccgcttc ctctgtcttt	1620
acggtatcgc cgctcccgat tcgcagcgca tcgccttcta tcgccttctt gacgagttct	1680
tctgagcggg actctggggt tcgaaatgac cgaccaagcg acgcccctgt tttgcaatgg	1740
cggtcggcga aagttgatgc gctgtatcgt ggtgaagatc aatccatgct gcgtgacgag	1800
gccacactgt gagttggtca gggggggcct actcggcggt ttccgacact gcgttggttg	1860
cggcagtgcg caccctctgg attgattgcg ggggtgccct gtcgctggtg tcgcctatcg	1920
acttaggggt aaaggctcgt cgcgaagtgc tgatgcgtgc gtcgcttgaa ccacaaatgg	1980
tcgatagcgt actcgcaggc tctatggctc aagcaagctt tgatgcttac ctgctccgcg	2040
ggcacattgg cttgtacagc ggtgttccca agtcggttcc ggccttgggg gtgcagcgca	2100

tttgcggcac aggcttcgaa ctgcttcggc aggccggcga gcagatttcc caaggcgctg 2160
atcacgtgct gtgtgtcgcg ggctgcag 2188

<210> 8
<211> 2171
<212> DNA
<213> Pseudomonas sp

<400> 8
ctgcagccga gcatcgattg agcactttac ccagctgcgc tggctgacca ttcagaatgg 60
cccgcggcac tatccaatct aaatcgatct tcgggcgcgc cgggcatcat gcccgcggcg 120
ctcgcctcat ttcaatctct aacttgataa aaacagagct gttctccggt cttggtggat 180
caaggccagt cgcggagagt ctcgaagagg agagtacagt gaacgccgag tccacattgc 240
aaccgcaggc atcatcatgc tctgctcagc cagctaccg cagtgtgtcg attggtcatc 300
ctccggttga ggttacgcaa gacgctggag gtattgtccg gatgcgttct ctcgaggcgc 360
ttcttccctt cccgggtcga attcttgagc gtctcgagca ttgggctaag acccgctccag 420
aaciaaacctg cgttgctgcc agggcgcaa atggggaatg gcgtcgtatc agctacgcgg 480
aatgtttcca caacgtccgc gccatcgcac agagcttgct tccttacgga ctatcggcag 540
agcgtccgct gcttatcgtc tctggaaatg acctggaaca tcttcagctg gcatttgggg 600
ctatgtatgc gggcattccc tattgcccgg tgtctcctgc ttattcactg ctgtcgcaag 660
atttggcgaa gctgcgtcac atcgtaggtc ttctgcaacc gggactggtc tttgctgccg 720
atgcagcacc tttccagggg gagaggcggt ttgcgtattg ggcgcatgca taaaaactgt 780
tgtaattcat taagcattct gccgacatgg aagccatcac aaacggcatg atgaacctga 840
atgccagcg gcatcagcac cttgtcgcct tgcgtataat atttgcccat ggacgcacac 900
cgtggaaacg gatgaaggca cgaaccagc tgacataagc ctgttcgggt cgtaaactgt 960
aatgcaagta gcgtatgcgc tcacgcaact ggtccagaac cttgaccgaa cgcagcgggt 1020
gtaacggcgc agtggcggtt ttcattggctt gttatgactg tttttttgta cagtctatgc 1080
ctcgggcata caagcagcaa gcgcgttacg ccgtgggtcg atgtttgatg ttatggagca 1140
gcaacgatgt tacgcagcag caacgatgtt acgcagcagg gcagtcgccc taaaacaaag 1200
ttaggtggct caagtatggg catcatcgc acatgtaggc tcggccctga ccaagtcaaa 1260

```

tccatgcggg ctgctcttga tcttttcggt cgtgagttcg gagacgtagc cacctactcc 1320
caacatcagc cggactccga ttacctcggg aacttgctcc gtagtaagac attcatcgcg 1380
cttgctgcct tcgaccaaga agcgggttgtt ggcgctctcg cggcttacgt tctgcccagg 1440
tttgagcagc cgcgtagtga gatctatatac tatgatctcg cagtctccgg cgagcaccgg 1500
aggcagggca ttgccaccgc gctcatcaat ctctcaagc atgaggccaa cgcgcttgg 1560
gcttatgtga tctacgtgca agcagattac ggtgacgatc ccgcagtggc tctctataca 1620
aagttgggca tacgggaaga agtgatgcac tttgatatcg acccaagtac cgccacctaa 1680
caattcggtc aagccgagat cggcttcccc tgttttgcaa tggcggtcgg cgaaagtga 1740
tgcgctgtat cgtgggtgaag atcaatccat gctgcgtgac gaggccacac tgtgagttgg 1800
tcaggggggg cttactcggc gttttccgac actgcgttgg ttgcggcagt gcgcaccccc 1860
tggaattgatt gcgggggtgc cctgtcgtg gtgtcgcta tcgacttagg ggtaaaggtc 1920
gctcggaag ttctgatgcg tgcgtcgctt gaaccacaaa tggtcgatag cgtactcgca 1980
ggctctatgg ctcaagcaag ctttgatgct tacctgctcc cgcggcacat tggcttgtag 2040
agcgggtgtc ccaagtcggt tccggccttg ggggtgcagc gcatttgcg cacaggcttc 2100
gaactgcttc ggcaggccgg cgagcagatt tccaaggcg ctgatcacgt gctgtgtgtc 2160
gcgggctgca g 2171

```

```

<210> 9
<211> 1203
<212> DNA
<213> Pseudomonas sp

```

```

<400> 9
ctgcagccga gcatcgattg agcactttac ccagctgcgc tggtgacca ttcagaatgg 60
cccgcggcac tatccaatct aaatcgatct tcgggcgcgc cgggcatcat gccgcggcg 120
ctcgccatcat ttcaatctct aacttgataa aaacagagct gttctccggc cttgggtggat 180
caaggccagt cgcggagagt ctggaagagg agagtacagt gaacgccgag tccacattgc 240
aaccgcaggc atcatcatgc tctgctcagc cacgctaccg cagtgtgtcg attggtcac 300
ctccggttga ggttacgcaa gacgctggag gtattgtccg gatgcgttct ctgaggcgc 360

```

```

ttcttccctt cccgggtcga attcttgagc gtctcgagca ttgggctaag acccgtccag 420
aaciaaacctg cgttgctgcc agggcggcaa atggggaatg gcgtcgtatc agctacgcgg 480
aatgtttcca caacgtccgc gccatcgcac agagcttgct tccttacgga ctatcggcag 540
agcgtccgct gcttatcgtc tctggaaatg acctggaaca tcttcagctg gcatttgggg 600
ctatgtatgc gggcattccc tattgcccgg tgtctcctgc ttattcactg ctgtcgcaag 660
atttggcgaa gctgcgtcac atcgtaggtc ttctgcaacc gggactggtc tttgctgccg 720
atgcagcacc tttccagcgc gctgttttgc aatggcggtc ggcgaaagtt gatgcgctgt 780
atcgtggtga agatcaatcc atgctgcgtg acgaggccac actgtgagtt ggtcaggggg 840
ggcttactcg gcgttttccg aactgcgtt ggttgcggca gtgcgcaccc cctggattga 900
ttgcgggggt gccctgtcgc tgggtgtcgc tatcgactta ggggtaaagg tcgctcgcga 960
agttctgatg cgtgcgtcgc ttgaaccaca aatggtcgat agcgtactcg caggctctat 1020
ggctcaagca agctttgatg cttacctgct cccgcggcac attggcttgt acagcgggtg 1080
tcccaagtcg gttccggcct tgggggtgca gcgcatttgc ggcacaggct tcgaactgct 1140
tcggcaggcc ggcgagcaga tttcccaagg cgctgatcac gtgctgtgtg tcgcgggctg 1200
cag 1203

```

```

<210> 10
<211> 1981
<212> DNA
<213> Pseudomonas sp

```

```

<400> 10
gaattcccct ggcgacgaaa gggcggcagg ccgcattggc acggctgggc ggtaactgat 60
gcttgcggtta atcgtaacc gtttgaaatt ccttgccaaa tttcggcgag agaatcatgc 120
gggtacgcct ttccgtgcgc ttgatctgct gcttccgtgc cttgaatcag aaaaatagtt 180
aattgacaga actatagggt cgtagtagct tttgctcacc caccaaacc acagcactgg 240
ggtgcacgat gaatagctac gatggccggt ggtctaccgt tgatgtgaag gttgaagaag 300
gtatcgcttg ggtcacgctg aaccgcccgg agaagcgcaa cgcaatgagc ccaactctca 360
atcgagagat ggtcgagggt ctggagggtg tggagcagga cgagatgct cgcgtgcttg 420
ttctgactgg tgcaggcgaa tcctggaccg cgggcatgga cctgaaggag tatttccgcg 480

```

agaccgatgc tggccccgaa attctgcaag agaagattcg tcggggacag caagcgaacc	540
ggaattgcca gctggggcgc cctctggtaa ggttgggaag ccctgcaaag taaactggat	600
ggctttcttg ccgccaagga tctgatggcg caggggatca agatctgac aagagacagg	660
atgaggatcg tttcgcatga ttgaacaaga tggattgcac gcaggttctc cggccgcttg	720
ggtggagagg ctattcggct atgactgggc acaacagaca atcggctgct ctgatgccgc	780
cgtgttccgg ctgtcagcgc aggggcgccc ggttcttttt gtcaagaccg acctgtccgg	840
tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca cgacgggcgt	900
tccttgcgca gctgtgctcg acgttgtcac tgaagcggga agggactggc tgctattggg	960
cgaagtgccg gggcaggatc tcctgtcatc tcaccttgct cctgccgaga aagtatccat	1020
catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc cattcgacca	1080
ccaagcgaaa catcgcatcg agcgagcacg tactcggatg gaagccggtc ttgtcgatca	1140
ggatgatctg gacgaagagc atcaggggct cgcgccagcc gaactgttcg ccaggctcaa	1200
ggcgcgcatg cccgacggcg aggatctcgt cgtgacccat ggcgatgcct gcttgccgaa	1260
tatcatggtg gaaaatggcc gcttttcttg attcatcgac tgtggccggc tgggtgtggc	1320
ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc ttggcggcga	1380
atgggctgac cgcttcctcg tgctttacgg tategccgct cccgattcgc agcgcatcgc	1440
cttctatcgc cttcttgacg agttcttctg agcgggactc tggggttcga aatgaccgac	1500
caagcgacgc cccgagcagg gcatgaagca gttccttgac gagaaaagca tcaagccggg	1560
cttgagacc tacaagcgct gataaatgcg ccggggccct cgctgcgccc ccggccttcc	1620
aataatgaca ataagagga gtgcccaatg tttcacgtgc ccctgcttat tgggtgtaag	1680
ccttgttcag catctgatga gcgcaccttc gagcgctcga gcccgctgac cggagaagtg	1740
gtatcgcgcg tcgctgctgc cagtttgaa gatgcggacg ccgcagtggc cgctgcacag	1800
gctgcgtttc ctgaatgggc ggcgcttgct ccgagcgaac gccgtgccc actgctgcga	1860
gcggcgatc ttctagagga ccgttcttcc gagttcaccg ccgcagcgag tgaaactggc	1920
gcagcgggaa actggtatgg gtttaacgtt tacctggcgg cgggcatgtt gcggggaatt	1980
c	1981

<210> 11
 <211> 1964
 <212> DNA
 <213> Pseudomonas sp

<400> 11
 gaattcccct ggcgacgaaa gggcggcagg ccgcatggcc acggctgggc ggtaactgat 60
 gcttgcggtta atcgtaacc gtttgaaatt ccttgccaaa ttcggcgag agaatcatgc 120
 gggtagcct ttccgtgcgc ttgatctgc gcttccgtgc cttgaatcag aaaaatagtt 180
 aattgacaga actatagggt cgcagtagct ttgtctacc caccaaacc acagcactgg 240
 ggtgcacgat gaatagctac gatggccgtt ggtctaccgt tgatgtgaag gttgaagaag 300
 gtatcgcttg ggtagcgtg aaccgcccgg agaagcgcaa cgcaatgagc ccaactctca 360
 atcgagagat ggtagaggtt ctggaggtgc tggagcagga cgcagatgct cgcgtgcttg 420
 ttctgactgg tgcaggcgaa tcctggaccg cgggcatgga cctgaaggag tatttccgcg 480
 agaccgatgc tggccccgaa attctgcaag agaagattcg tcgggggaga ggcgggttgc 540
 gtattgggcg catgcataaa aactgttgta attcattaag cattctgccg acatggaagc 600
 catcacaac gccatgatga acctgaatcg ccagcggcat cagcaccttg tcgccttgcg 660
 tataatattt gccatggac gcacaccgtg gaaacggatg aaggcacgaa ccagttgac 720
 ataagcctgt tcggttcgta aactgtaatg caagtagcgt atgcgctcac gcaactggtc 780
 cagaaccttg accgaacgca gcggtggtta cggcgagtg gcggttttca tggcttgta 840
 tgactgtttt ttgtacagt ctatgcctcg ggcattcaag cagcaagcgc gttacgccgt 900
 gggtagatgt ttgatgttat ggagcagcaa cgatgttacg cagcagcaac gatgttacgc 960
 agcagggcag tcgccctaaa acaaagttag gtggctcaag tatgggcatc attcgacat 1020
 gtaggctcgg ccctgaccaa gtcaaatcca tgcgggctgc tcttgatctt ttcggtcgtg 1080
 agttcggaga cgtagccacc tactcccaac atcagccgga ctccgattac ctcggaact 1140
 tgctccgtag taagacattc atcgcgcttg ctgccttcga ccaagaagcg gttgttggcg 1200
 ctctcgcggc ttacgttctg ccaggtttg agcagccgcg tagtgagatc tatatctatg 1260
 atctcgagct ctccggcgag caccggaggc agggcattgc caccgcgctc atcaatctcc 1320

tcaagcatga ggccaacgcg cttggtgctt atgtgatcta cgtgcaagca gattacgggtg 13
 acgatcccg c agtggctctc tatacaaagt tgggcatacg ggaagaagtg atgcactttg 144
 atatcgaccc aagtaccgcc acctaacaat tcgttcaagc cgagatcggc ttccccgagc 1500
 agggcatgaa gcagttcctt gacgagaaaa gcatcaagcc gggcttgag acctacaagc 1560
 gctgataaat gcgccggggc cctcgctgcg cccccggcct tccaataatg acaataatga 1620
 ggagtgccca atgtttcacg tgcccctgct tattgggtgg aagccttggt cagcatctga 1680
 tgagcgcacc ttcgagcgtc gtagcccgct gaccggagaa gtggtatcgc gcgtcgctgc 1740
 tgccagtttg gaagatgcgg acgccgcagt ggccgctgca caggctgcgt ttctgaatg 1800
 gggggcgctt gtcgcgagcg aacgccgtgc ccgactgctg cgagcggcgg atcttctaga 1860
 ggaccgttct tccgagttca ccgccgcagc gagtgaact ggcgcagcgg gaaactggta 1920
 tgggtttaac gtttacctgg cggcgggcat gttgcgggga attc 1964

<210> 12
 <211> 992
 <212> DNA
 <213> Pseudomonas sp

<400> 12
 gaattccctt ggcgacgaaa gggcggcagg ccgcatggcc acggctgggc ggtaactgat 60
 gcttgcgta atcgtaacc gtttgaaatt ccttgccaaa ttctggcgag agaatcatgc 120
 gggtagcct ttccgtgcgc tttgatctgc gttccgtgc cttgaatcag aaaaatagtt 180
 aattgacaga actatagggt cgcagtagct tttgctcacc caccaaacc acagcactgg 240
 ggtgcacgat gaatagctac gatggccgtt ggtctaccgt tgatgtgaag gttgaagaag 300
 gtatcgcttg ggtcacgctg aaccgcccgg agaagcgcaa cgcaatgagc ccaactctca 360
 atcgagagat ggtcgagggt ctggagggtg tggagcagga cgcagatgct cgcgtgcttg 420
 ttctgactgg tgcaggcgaa tcctggaccg cgggcatgga cctgaaggag tatttccgcg 480
 agaccgatgc tggccccgaa attctgcaag agaagattcg tcgcgagcag ggcataagc 540
 agttccttga cgagaaaagc atcaagccgg gcttgacagc ctacaagcgc tgataaatgc 600
 gccggggccc tcgctgcgcc cccggccttc caataatgac aataatgagg agtgcccaat 660
 gtttcacgtg ccctgctta ttggtggtaa gccttgttca gcactgatg agcgcacctt 720

cgagcgtcgt agcccgtga ccggagaagt ggtatcgcg ctcgctgctg ccagtttgga 780
 agatgcggac gccgcagtgg ccgctgcaca ggctgcgttt cctgaatggg cggcgcttgc 840
 tccgagcgaa cgccgtgccc gactgctgcg agcggcggat cttctagagg accgttcttc 900
 cgagttcacc gccgcagcga gtgaaactgg cgcagcggga aactggatat ggtttaacgt 960
 ttacctggcg gcgggcatgt tgcggggaat tc 992

<210> 13
 <211> 2539
 <212> DNA
 <213> Pseudomonas sp

<400> 13
 gaattccaat aatgacaata atgaggagtg cccaatgttt cacgtgcccc tgcttattgg 60
 tggtaagcct tggtcagcat ctgatgagcg caccttcgag cgtcgtagcc cgctgaccgg 120
 agaagtggta tcgcgctcg ctgctgccag tttggaagat gcggacgccg cagtggccgc 180
 tgcacaggct gcgtttctcg aatgggcggc gcttgcctcg agcgaacgcc gtgcccgaact 240
 gctgcgagcg gcgatcttc tagaggaccg ttcttccgag ttcaccgccg cagcgagtga 300
 aactggcgca gcgggaaact ggtatgggtt taacgtttac ctggcggcgg gcatgttgcg 360
 ggaagccgcg gccatgacca cacagattca gggcgatgtc attccgtcca atgtgcccgg 420
 tagctttgcc atggcggttc gacagccatg tggcggtgtg ctcggtattg cgccttgga 480
 tgctccggtg atccttggcg tacgggctgt tgcgatgccg ttggcatgcg gcaataccgt 540
 ggtgttgaaa agctctgagc tgagtcctt taccatcgc ctgattggtc aggtgttgca 600
 tgatgctggt ctgggggatg gcgtggtgaa tgtcatcagc aatgccccgc aagacgtcc 660
 tgcggtggtg gagcgactga ttgcaaactc tgcggtacgt cgagtgaact tcaccggttc 720
 gaccacgtt ggacggatca ttggtgagct gtctgcgcgt catctgaagc ctgctgtgct 780
 ggaattaggt ggtaaggctc cgttcttggc cttggacgat gccgacctcg atgcggcgg 840
 cgaagcggcg gcctttggtg cctacttcaa tcagggtcaa atctgcatgt ccaactgagcg 900
 tctgattgtg acagcagtcg cagacgcctt tgttgaaaag ctggcgagga aggtcgccac 960
 actgcgtgct ggcgatccta atgatccga atcggtcttg ggttcgttga ttgatgcaa 1020

tgcagggtcaa cgcattccagg ttctgggtcga tgatgcgctc ggggacagca agcgaaccgg	1080
aattgccagc tggggcgccc tctggtaagg ttgggaagcc ctgcaaagta aactggatgg	1140
ctttcttgcc gccaaaggatc tgatggcgca ggggatcaag atctgatcaa gagacaggat	1200
gaggatcggt tcgcatgatt gaacaagatg gattgcacgc aggttctccg gccgcttggg	1260
tggagaggct attcggctat gactgggcac aacagacaat cggctgctct gatgccgccg	1320
tgttccggct gtcagcgagc gggcgcccgg ttctttttgt caagaccgac ctgtccggtg	1380
ccctgaatga actgcaggac gaggcagcgc ggctatcgtg gctggccacg acgggcgttc	1440
cttgcgagc tgtgctcgac gttgtcactg aagcgggaag ggactggctg ctattgggcg	1500
aagtgccggg gcaggatctc ctgtcatctc accttgctcc tgccgagaaa gtatccatca	1560
tggctgatgc aatgcggcgg ctgcatacgc ttgatccggc tacctgccca ttcgaccacc	1620
aagcgaaaca tcgcatcgag cgagcacgta ctcggatgga agccggtctt gtcgatcagg	1680
atgatctgga cgaagagcat caggggctcg cgccagccga actgttcgcc aggtcaagg	1740
cgcgatgcc cgacggcgag gatctcgctg tgacccatgg cgatgcctgc ttgccgaata	1800
tcattggtgga aaatggccgc ttttctggat tcatcgactg tggccggctg ggtgtggcgg	1860
accgctatca ggacatagcg ttggctaccc gtgatattgc tgaagagctt ggcggcgaat	1920
gggctgaccg cttctcgtg ctttacggta tcgccgctcc cgattcgag cgcatgcct	1980
tctatgcct tcttgacgag ttcttctgag cgggactctg gggttcgaaa tgaccgacca	2040
agcgacgccc ggcccagcgc gtcgattcgg gcatttgcca tatcaatgga ccgactgtgc	2100
atgacgaggc tcagatgcca ttcggtgggg tgaagtccag cggctacggc agcttcggca	2160
gtcgagcatc gattgagcac ttaccacgc tcgctggct gaccattcag aatggcccgc	2220
ggcactatcc aatctaaatc gatcttcggg cgccgcgggc atcatgccc cggcgctcgc	2280
ctcatttcaa tctctaactt gataaaaaca gagctgttct ccggtcttgg tggatcaagg	2340
ccagtcgcgg agagtctcga agaggagagt acagtgaacg ccgagtccac attgcaaccg	2400
caggcatcat catgctctgc tcagccacgc taccgcagtg tgtcgattgg tcatcctccg	2460
gttgagggtta cgcaagacgc tggagggtatt gtccggatgc gttctctcga ggcgcttctt	2520
cccttcccgg gtggaattc	2539

<210> 14
 <211> 2506
 <212> DNA
 <213> Pseudomonas sp

<400> 14
 gaattccaat aatgacaata atgaggagtg cccaatgttt cacgtgcccc tgcttattgg 60
 tggtaagcct tgttcagcat ctgatgagcg caccttcgag cgtcgtagcc cgctgaccgg 120
 agaagtggta tcgcgcgctg ctgctgccag tttggaagat gcggacgccg cagtggccgc 180
 tgcacaggct gcgtttcctg aatgggcggc gcttgctccg agcgaacgcc gtgcccgact 240
 gctgcgagcg gcggatcttc tagaggaccg ttcttccgag ttcaccgccg cagcgagtga 300
 aactggcgca gcgggaaact ggtatgggtt taacgtttac ctggcgggcg gcatgttgcg 360
 ggaagccgcg gccatgacca cacagattca gggcgatgtc attccgtcca atgtgcccgg 420
 tagctttgcc atggcggttc gacagccatg tggcggtgtg ctcggtattg cgccttgga 480
 tgctccggtg atccttggcg tacgggctgt tgcgatgccg ttggcatgcg gcaataaccgt 540
 ggtgttgaaa agctctgagc tgagtccctt taccatcgc ctgattggtc aggtgttgca 600
 tgatgctggt ctgggggatg gcgtggtgaa tgtcatcagc aatgccccgc aagacgctcc 660
 tgcggtggtg gagcgactga ttgcaaatec tgcggtacgt cgagtgaact tcaccggttc 720
 gaccacggtt ggacggatca ttggtgagct gtctgcgct catctgaagc ctgctgtgct 780
 ggaattaggt ggtaaggctc cgcttcttgg cttggacgat gccgacctcg atgcggcggt 840
 cgaagcggcg gcctttggtg cctacttcaa tcagggtcaa atctgcatgt ccactgagcg 900
 tctgattgtg acagcagtcg cagacgcctt tgttgaaaag ctggcgagga aggtcgccac 960
 actgcgtgct ggcgatccta atgatccgca atcggctctt ggttcggtga ttgatgccaa 1020
 tgcagggtcaa cgcattccagg tggggagagg cggtttgcgt attgggcgca tgcataaaaa 1080
 ctgttgtaat tcattaagca ttctgccgac atggaagcca tcacaaacgg catgatgaac 1140
 ctgaatcgcc agcggcatca gcaccttgtc gccttgcgta taatatttgc ccatggacgc 1200
 acaccgtgga aacggatgaa ggcacgaacc cagttgacat aagcctgttc ggttcgtaaa 1260
 ctgtaatgca agtagcgtat gcgctcacgc aactgggtcca gaaccttgac cgaacgcagc 1320
 ggtggtaacg gcgcagtggc gggtttcatg gcttggttatg actgtttttt tgtacagtct 1380

```

atgcctcggg catccaagca gcaagcgcgt tacgccgtgg gtcgatgttt gatgttatgg 1440
agcagcaacg atgttacgca gcagcaacga tgttacgcag cagggcagtc gccctaaaac 1500
aaagttaggt ggctcaagta tgggcatcat tcgcacatgt aggctcggcc ctgaccaagt 1560
caaatccatg cgggctgctc ttgatctttt cggtcgtgag ttcggagacg tagccaccta 1620
ctcccaacat cagccggact ccgattacct cgggaacttg ctccgtagta agacattcat 1680
cgcgcttgct gccttcgacc aagaagcggg tggtggcgct ctgcggtt acgttctgcc 1740
caggtttgag cagccgcgta gtgagatcta tatctatgat ctgcagtcct ccggcgagca 1800
ccggaggcag ggcattgcca ccgcgctcat caatctctc aagcatgagg ccaacgcgct 1860
tggtgcttat gtgatctacg tgcaagcaga ttacggtgac gatcccgagc tggtctctta 1920
tacaaagttg ggcatacggg aagaagtgat gcactttgat atcgacccaa gtaccgccac 1980
ctaacaattc gttcaagccg agatcggctt cccaattggc ccagcgcgtc gattcgggca 2040
tttgccatat caatggaccg actgtgcatg acgaggctca gatgccattc ggtggggtga 2100
agtccagcgg ctacggcagc ttcggcagtc gagcatcgat tgagcacttt acccagctgc 2160
gctggtgac cattcagaat ggcccgcggc actatccaat ctaaatcgat cttcgggcgc 2220
cgcgggcatc atgcccgcgg cgctcgctc atttcaatct ctaacttgat aaaaacagag 2280
ctgttctccg gtcttggtgg atcaaggcca gtcgcggaga gtctcgaaga ggagagtaca 2340
gtgaacgccg agtccacatt gcaaccgcag gcatcatcat gctctgctca gccacgctac 2400
cgcagtggtg cgattggtea tcttcgggtt gaggttacgc aagacgctgg aggtattgtc 2460
cggatgcgtt ctctcgaggc gttcttccc ttcccgggtg gaattc 2506

```

```

<210> 15
<211> 1571
<212> DNA
<213> Pseudomonas sp

```

```

<400> 15
gaattccaat aatgacaata atgaggagtg cccaatgttt cacgtgcccc tgcttattgg 60
tggtaaacct tggtcagcat ctgatgagcg caccttcgag cgctgtagcc cgctgaccgg 120
agaagtggta tcgcgcgtcg ctgctgccag tttggaagat gcggacgccg cagtggccgc 180

```

tgacacaggct gcgtttcctg aatgggcggc gcttgctccg agcgaacgcc gtgcccgaact	
gctgcgagcg gcggatcttc tagaggaccg ttcttccgag ttcaccgccg cagcgagtga	3
aactggcgca gcgggaaact ggtatgggtt taacgtttac ctggcgggcg gcatgttgcg	36
ggaagccgcg gccatgacca cacagattca gggcgatgtc attccgtcca atgtgcccgg	420
tagctttgcc atggcggttc gacagccatg tggcggtgtg ctcgggtattg cgccttgga	480
tgctccggta atccttggcg tacgggctgt tgcgatgccg ttggcatgcg gcaataccgt	540
ggtgttgaaa agctctgagc tgagtcctt taccatcgc ctgattggtc aggtgttgca	600
tgatgctggt ctgggggatg gcgtggtgaa tgtcatcagc aatgccccgc aagacgctcc	660
tgcggtggtg gagcgactga ttgcaaatac tgcggtacgt cgagtgaact tcaccggttc	720
gaccacggtt ggacggatca ttggtgagct gtctgcgcgt catctgaagc ctgctgtgct	780
ggaattaggt ggtaaggctc cgttcttgggt cttggacgat gccgacctcg atgcggcggt	840
cgaagcggcg gcctttggtg cctacttcaa tcagggtcaa atctgcatgt cactgagcg	900
tctgattgtg acagcagtcg cagacgcctt tgttgaaaag ctggcgagga aggtcgccac	960
actgctgctt ggcgatccta atgatccgca atcggtcttg ggttcgttga ttgatgccaa	1020
tgcagggtcaa cgcattccagg ttctgggtga tgatgcgctc gcaaaaggcg cgcaatggaa	1080
ttggcccagc gcgtcgattc gggcatttgc catatcaatg gaccgactgt gcatgacgag	1140
gctcagatgc cattcggttg ggtgaagtcc agcggctacg gcagcttcgg cagtcgagca	1200
tcgattgagc actttaccca gctgcgctgg ctgaccattc agaatggccc gcggcactat	1260
ccaatctaaa tcgatcttcg ggcgcgcggg gcatcatgcc cgcggcgctc gcctcatttc	1320
aatctctaac ttgataaaaa cagagctggt ctccggtctt ggtggatcaa ggccagtcgc	1380
ggagagtctc gaagaggaga gtacagtga cgccgagtc acattgcaac cgcaggcatc	1440
atcatgctct gctcagccac gctaccgcag tgtgtcgatt ggtcactctc cggttgaggt	1500
tacgcaagac gctggaggta ttgtccggat gcgttctctc gaggcgcttc ttcccttccc	1560
gggtggaatt c	1571

<210> 16
 <211> 2526
 <212> DNA

<213> Pseudomonas sp

<400> 16

gaattccgcg gtcggcgaaa gttgatgcgc tgtatcgtgg tgaagatcaa tccatgctgc	60
gtgacgagggc cacactgtga gttggtcagg gggggcttac tcggcgtttt ccgacactgc	120
gttggttgcg gcagtgcgca ccccttgat tgattgcggg ggtgccctgt cgctggtgtc	180
gcctatcgac ttaggggtaa aggtcgctcg cgaagttctg atgcgtgcgt cgcttgaacc	240
acaaatggtc gatagcgtag tcgcaggctc tatggctcaa gcaagctttg atgcttacct	300
gctcccgcg caccattggct tgtacagcgg tgttcccaag tcggttccgg ccttgggggt	360
gcagcgcatt tgcggcacag gcttcgaact gcttcggcag gccggcgagc agatttccca	420
aggcgctgat cacgtgctgt gtgtcgcggc agagtccatg tcgcgtaacc ccatcgcgtc	480
gtatacacac cggggcgggg tccgcctcgg tgcgcccgtt gagttcaagg atttttgtg	540
ggaggcattg tttgatcctg ctccaggact cgacatgac gctaccgcag aaaacctggg	600
gacagcaagc gaaccggaat tgccagctgg ggcgcctct ggtaagggtg ggaagccctg	660
caaagtaaac tggatggctt tcttgccgcc aaggatctga tggcgaggg gatcaagatc	720
tgatcaagag acaggatgag gatcgtttcg catgattgaa caagatggat tgcacgcagg	780
ttctccggcc gcttgggtgg agaggctatt cggctatgac tgggcacaac agacaatcgg	840
ctgctctgat gccgcctgt tccggctgtc agcgagggg cgcccggttc tttttgtcaa	900
gaccgacctg tccggtgccc tgaatgaact gcaggacgag gcagcgcggc tatcgtggct	960
ggccacgacg ggcgttcctt ggcagctgt gctcgacgtt gtcactgaag cgggaaggga	1020
ctggctgcta ttgggcgaag tgccggggca ggatctcctg tcatctcacc ttgctcctgc	1080
cgagaaagta tccatcatgg ctgatgcaat gcggcggtg catacgcttg atccggctac	1140
ctgcccattc gaccaccaag cgaaacatcg catcgagcga gcacgtactc ggatggaagc	1200
cggctctgtc gatcaggatg atctggacga agagcatcag gggctcgcg cagccgaact	1260
gttcgccagg ctcaaggcgc gcatgccga cggcgaggat ctcgtcgtga cccatggcga	1320
tgctgcttg ccgaatatca tgggtgaaaa tggccgcttt tctggattca tcgactgtgg	1380
ccggctgggt gtggcggaac gctatcagga catagcgttg gctaccgtg atattgctga	1440
agagcttggc ggcgaaatgg ctgaccgctt cctcgtgctt tacgggtatcg ccgctccga	1500

ttcgcagcgc atcgcccttct atcgcccttct tgacgagttc ttctgagcgg gactctgggg	
ttcgaaatga ccgaccaagc gacgccatt gagggcgcaa gaggagaaat ggattgacca	10
agagatcgtg gctgttacgg atgaacagtt cgatttagag ggctacaaca gtcgagcaat	160
tgaactgcct cggaaggcaa aattgttgat cgtgacagtc atccgcggcc tagcagtctt	1740
tgaagccctt tcccgattga agcctgttca ttctggcggg gtgcagactg cgggcaacag	1800
ctgtgccgta gtggacggcg ccgcggcggc tttggtggct cgagagtcgt ctgcgacaca	1860
gccggtcttg gctaggatac tggctacctc cgtagtcggg atcgagcccg agcatatggg	1920
gctcggccct gcgcccgcga ttgcctgct gcttgccgct agtgatctta gtttgaggga	1980
tatcgacctc tttagataa acgaggcgca ggccgcccaa gttctagcgg tacagcatga	2040
attgggtatt gagcactcaa aacttaatat ttggggcggg gccattgcac ttggacaccc	2100
gcttgccgcg accggattgc gtctctgcat gaccctcgt caccaattgc aagctaataa	2160
ctttcgatat ggaattgcct cggcatgcat tgggtgggga caggggatgg cggttctttt	2220
agagaatccc cacttcggtt cgtcctctgc acgaagtctg atgattaaca gagttgacca	2280
ctatccactg agctaacggg catctccttt gttgctttga ggtggcgcac gaaggagggc	2340
tcgaaaatct ctgctaaaaa caagaagaag gaacaggga catgattagt ttcgctcgta	2400
tggcagaaaag tttaggagtc caggctaaac ttgcccttgc cttcgcactc gtattatgtg	2460
tcgggctgat tgttaccggc acgggtttct acagtgtaca taccttgtca gggttggtgg	2520
gaattc	2526

<210> 17
 <211> 2509
 <212> DNA
 <213> Pseudomonas sp

<400> 17	
gaattccgcg gtcggcgaaa gttgatgcgc tgtatcgtgg tgaagatcaa tccatgctgc	60
gtgacgaggc cacactgtga gttggtcagg gggggcttac tcggcgtttt ccgacactgc	120
gttggttgcg gcagtgcgca cccctggat tgattgcggg ggtgccctgt cgctggtgtc	180
gcctatcgac ttaggggtaa aggtcgctcg cgaagtctg atgcgtgcgt cgcttgaacc	240

acaaatggtc gatagcgtac tcgcaggctc tatggctcaa gcaagctttg atgcttacct	300
gctcccgcg caccattggct tgtacagcgg tggtcccaag tcggttcgg ccttgggggt	360
gcagcgcat tgcggcacag gcttcgaact gcttcggcag gccggcgagc agatttccca	420
aggcgctgat cacgtgctgt gtgtcgcggc agagtccatg tcgcgtaacc ccatcgcgtc	480
gtatacacac cggggcggggt tccgcctcgg tgcgcccgtt gagttcaagg attttttgtg	540
ggaggcattg tttgatcctg ctccaggact cgacatgatc gctaccgcag aaaacctggg	600
ggagaggcgg tttgcgtatt gggcgcatgc ataaaaactg ttgtaattca ttaagcattc	660
tgccgacatg gaagccatca caaacggcat gatgaacctg aatcgccagc ggcacagca	720
ccttgtcgcc ttgcgtataa tatttgccca tggacgcaca ccgtggaac ggatgaaggc	780
acgaaccag ttgacataag cctgttcggt tcgtaaactg taatgcaagt agcgtatgcg	840
ctcacgcaac tgggtccagaa ccttgaccga acgcagcggg ggtaacggcg cagtggcggg	900
tttcatggct tggtatgact gtttttttgt acagtctatg cctcgggcat ccaagcagca	960
agcgcggttac gccgtgggtc gatgtttgat gttatggagc agcaacgatg ttacgcagca	1020
gcaacgatgt tacgcagcag ggcagtcgcc ctaaaacaaa gttaggtggc tcaagtatgg	1080
gcatcattcg cacatgtagg ctcgccctg accaagtcaa atccatgcgg gctgctcttg	1140
atcttttcgg tcgtgagttc ggagacgtag ccacctactc ccaacatcag ccggactccg	1200
attacctcgg gaacttgctc cgtagtaaga cattcatcgc gcttgctgcc ttcgaccaag	1260
aagcggttgt tggcgctctc gcggcttacg ttctgccag gtttgagcag ccgcgtagt	1320
agatctatat ctatgatctc gcagtctccg gcgagcaccg gaggcagggc attgccaccg	1380
cgctcatcaa tctcctcaag catgaggcca acgcgcttgg tgcttatgtg atctacgtgc	1440
aagcagatta cggtgacgat cccgcagtgg ctctctatac aaagttgggc atacgggaag	1500
aagtgatgca ctttgatata gacccaagta ccgccaccta acaattcggt caagccgaga	1560
tcggcttccc attgagggcg caagaggaga aatggattga ccaagagatc gtggctgtta	1620
cggatgaaca gttcgattta gagggtaca acagtcgagc aattgaactg cctcggaagg	1680
caaaattgtt gatcgtgaca gtcacccgg gcctagcagt ctttgaagcc ctttcccgat	1740
tgaagcctgt tcattctggc ggggtgcaga ctgcgggcaa cagctgtgcc gtagtggacg	1800

gcgccgcggc ggctttggtg gctcgagagt cgtctgcgac acagccggtc ttggctagga 1860
 tactggctac ctccgtagtc gggatcgagc cggagcatat ggggctcggc cctgcgcccg 1920
 cgattcgctt gctgcttgcg cgtagtgttc ttagtttgag ggatatcgac ctctttgaga 1980
 taaacgagggc gcaggccgcc caagttctag cggtagacga tgaattgggt attgagcact 2040
 caaaacttaa tatttggggc ggggccattg cacttggaca cccgcttgcc gcgaccggat 2100
 tgcgctctctg catgaccctc gctcaccaat tgcaagctaa taactttcga tatggaattg 2160
 cctcggcatg cattggtggg ggacagggga tggcggttct tttagagaat ccccacttcg 2220
 gttcgtcctc tgcacgaagt tcgatgatta acagagttga ccactatcca ctgagctaac 2280
 gggcatctcc tttgttgctt tgaggtggcg cacgaaggag ggctcgaaaa tctctgctaa 2340
 aaacaagaag aaggaacagg gaacatgatt agtttcgctc gtatggcaga aagtttagga 2400
 gtccaggcta aacttgccct tgccttcgca ctcgatttat gtgtcgggct gattgttacc 2460
 ggcacggggt tctacagtgt acataccttg tcagggttgg tgggaattc 2509

<210> 18
 <211> 1543
 <212> DNA
 <213> Pseudomonas sp

<400> 18
 gaattccgcg gtcggcgaaa gttgatgcgc tgtatcgtgg tgaagatcaa tccatgctgc 60
 gtgacgagggc cacactgtga gttggtcagg gggggcttac tcggcgtttt ccgacactgc 120
 gttggttgcg gcagtgcgca cccctggat tgattgcggg ggtgccctgt cgctggtgtc 180
 gcctatcgac ttaggggtaa aggtcgctcg cgaagttctg atgcgtgcgt cgcttgaacc 240
 acaaatggtc gatagcgtag tcgcaggctc tatggctcaa gcaagctttg atgcttacct 300
 gctcccgcgg cacattggct tgtacagcgg tgttcccaag tcggttccgg ccttgggggt 360
 gcagcgcatt tgcggcacag gcttcgaact gcttcggcag gccggcgagc agatttccca 420
 aggcgctgat cacgtgctgt gtgtcgcggc agagtccatg tcgcgtaacc ccatcgcgtc 480
 gtatacacac cggggcgggt tccgcctcgg tgcgccggtt gagttcaagg attttttgtg 540
 ggaggcattg tttgatcctg ctccaggact cgacatgata gctaccgcag aaaacctggc 600
 gcgcattgag ggcgcaagag gagaaatgga ttgaccaaga gatcgtgggt gttacggatg 660

aacagttcga tttagagggc tacaacagtc gagcaattga actgcctcgg aaggcaaaat	72
tggtgatcgt gacagtcac cgcggcctag cagtctttga agccctttcc cgattgaagc	780
ctgttcattc tggcggggtg cagactgcgg gcaacagctg tgccgtagtg gacggcgccg	840
cggcggttt ggtggctcga gagtcgtctg cgacacagcc ggtcttggct aggatactgg	900
ctacctcgt agtcgggatc gagcccgagc atatggggct cggccctgcg cccgcgattc	960
gcctgctgct tgccgtagt gatcttagtt tgagggatat cgacctcttt gagataaacg	1020
aggcgaggc cgcccaagtt ctagcggtac agcatgaatt gggtattgag cactcaaac	1080
ttaatatttg gggcggggcc attgcacttg gacaccgct tgccgcgacc ggattgcgtc	1140
tctgcatgac cctcgctcac caattgcaag ctaataactt tcgatatgga attgcctcgg	1200
catgcattgg tgggggacag gggatggcgg ttcttttaga gaatccccac ttcggttcgt	1260
cctctgcacg aagttcgatg attaacagag ttgaccacta tccactgagc taacgggcat	1320
ctcctttggt gctttgaggt ggcgcacgaa ggagggtcgc aaaatctctg ctaaaaacaa	1380
gaagaaggaa cagggaacat gattagtctt gctcgtatgg cagaaagttt aggagtccag	1440
gctaaacttg cccttgctt cgcactcgta ttatgtgtcg ggctgattgt taccggcacg	1500
ggtttctaca gtgtacatac cttgtcaggg ttggtgggaa ttc	1543